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## **(G\*) Fluorescence of optical materials down to 4 K - acrylic, TPB, pyrene**

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Many particle detectors that use liquid scintillators house it in an acrylic vessel. The acrylic may be coated by a wavelength shifter if the scintillation light produced from particle interactions is outside the wavelength range of the photodetectors. We have investigated the low-temperature properties of pyrene as an alternative to 1,1,4,4-tetraphenyl-1,3-butadiene (TPB) as pyrene has a much longer fluorescence time which could be useful for pathological background rejection in a detector. The fluorescence properties of pyrene-polystyrene coated acrylic were studied using samples with various concentrations and fluorescence grades of pyrene. In addition, we have studied the fluorescence of the acrylic itself, as it could form a background in rare-event searches and compared the relative light yield of pyrene to TPB at different temperatures. All these materials were excited with 285 nm UV light and studied at various temperatures between 4 K and 300 K to cover the operating temperatures of most particle detectors. We present the changes in the spectra and light yields of all these materials with temperature and discuss an additional analysis of the temperature dependence of the pyrene fluorescence time constants.

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